

 <p>Financial Assistance Award</p> <p>DENALI COMMISSION 510 L Street, Suite 410 Anchorage, Alaska 99501 (907) 271-1414 (phone) (907) 271-1415 (fax) www.denali.gov</p>		Award Number	01233-00																																																																														
		Award Title	High Penetration Hybrid Power System																																																																														
		Performance Period	January 1, 2010 through March 31, 2011																																																																														
Authority 112 Stat 1854		CFDA Number 90.100		Recipient Organization & Address University of Alaska Fairbanks PO BOX 757880 3295 COLLEGE ROAD 109 ASC Fairbanks, AK 99775-7880																																																																													
Denali Commission Finance Officer Certification		Jennifer Price 02/25/2010		Phone: (907) 474-6264 Recipient DUNS # 615245164 TIN # 926000147																																																																													
Cost Share Distribution Table																																																																																	
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Accounting Code</th> <th colspan="2">New Funding</th> <th colspan="2">Prior Period Funding</th> <th rowspan="2">Total</th> </tr> <tr> <th>Denali Commission</th> <th>Other Contributors</th> <th>Denali Commission</th> <th>Other Contributors</th> </tr> </thead> <tbody> <tr> <td>95670000AL</td> <td>\$433,045.00</td> <td></td> <td>\$0.00</td> <td></td> <td>\$433,045.00</td> </tr> <tr><td></td><td>\$0.00</td><td></td><td>\$0.00</td><td></td><td>\$0.00</td></tr> <tr><td></td><td>\$0.00</td><td></td><td>\$0.00</td><td></td><td>\$0.00</td></tr> <tr><td></td><td>\$0.00</td><td></td><td>\$0.00</td><td></td><td>\$0.00</td></tr> <tr><td></td><td>\$0.00</td><td></td><td>\$0.00</td><td></td><td>\$0.00</td></tr> <tr><td></td><td></td><td>\$0.00</td><td></td><td>\$0.00</td><td>\$0.00</td></tr> <tr><td></td><td></td><td>\$0.00</td><td></td><td>\$0.00</td><td>\$0.00</td></tr> <tr><td></td><td></td><td>\$0.00</td><td></td><td>\$0.00</td><td>\$0.00</td></tr> <tr><td></td><td></td><td>\$0.00</td><td></td><td>\$0.00</td><td>\$0.00</td></tr> <tr><td></td><td></td><td>\$0.00</td><td></td><td>\$0.00</td><td>\$0.00</td></tr> <tr> <td>Total</td> <td>\$433,045.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$433,045.00</td> </tr> </tbody> </table>						Accounting Code	New Funding		Prior Period Funding		Total	Denali Commission	Other Contributors	Denali Commission	Other Contributors	95670000AL	\$433,045.00		\$0.00		\$433,045.00		\$0.00		\$0.00		\$0.00		\$0.00		\$0.00		\$0.00		\$0.00		\$0.00		\$0.00		\$0.00		\$0.00		\$0.00			\$0.00		\$0.00	\$0.00			\$0.00		\$0.00	\$0.00			\$0.00		\$0.00	\$0.00			\$0.00		\$0.00	\$0.00			\$0.00		\$0.00	\$0.00	Total	\$433,045.00	\$0.00	\$0.00	\$0.00	\$433,045.00
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Signature of Authorized Official - Denali Commission Electronically Signed			Typed Name and Title Joel Neimeyer Federal Co-Chair		Date 02/18/2010																																																																												

AWARD ATTACHMENTS

University of Alaska Fairbanks

01233-00

1. Award Conditions - High Penetration Hybrid Power System

***Award Conditions to the Financial Assistance Award
Between the Denali Commission and University of Alaska Fairbanks, Alaska
Center for Energy and Power
For High Penetration Hybrid Power System
Award No. 01233
January 2010***

1. Scope of Work

This award provides \$433,045 to the University of Alaska Fairbanks (UAF), Alaska Center for Energy and Power (ACEP) for the Wind Diesel Application Center's (WiDAC) High Penetration Hybrid Power System Analysis.

Project Budget:

Equipment	\$277,064
Installation/Electricity for testing	\$9,000
Research Personnel	\$90,603
Indirect	\$50,581
Travel	\$3,752
Journal Publication	\$2,000

University faculty and staff consist of roughly 40% of the total budget. This includes sufficient time for the sophisticated level of testing which will be done as well as time for a full time graduate student to assist in the work. Travel money is included for a trip to Northern Power in order to meet with their engineering staff and work with their testing facilities to better understand the potential of their inverter technology. A trip will also be made to the National Renewable Energy Lab's Wind Test Site to facilitate the design of testing configuration. Equipment costs consist of 60% of the overall budget as is needed to carry out the testing agenda.

University of Alaska Cost Share:

- Facility to conduct research for this project located at the Golden Valley Electric Association BESS Facility (value is \$28,800 per year).
- ACEP's existing Diesel Engine Testbed will be used to support the research plan, which includes a 4 cylinder, 1200 rpm, prime power 125 kW, electronically controlled Detroit Diesel turbocharged series 50 engine coupled to a 125 kW AC synchronous generator. The engine is housed in a 40 ft x 8 ft insulated enclosure containing two 300 gallon fuel tanks and the normal engine peripherals, such as fuel filtering systems, charge air and jacket water cooling systems, and engine control systems. The generator is coupled to a LoadTec computer controlled 250 kW resistive/inductive load bank. The total value of the test bed is \$50,000.
- ACEP's existing battery testing laboratory located at the MIRL Building on the University of Alaska campus will be used to support this research. This includes a 10kW load bank, and associated instrumentation and data logging equipment. The total value of this equipment is valued at \$30,000.

Diesel-off hybrid power systems represent the next generation wind-diesel systems. In traditional systems, the diesel gen-set regulates both the voltage and frequency of the grid. In order to maximize fuel savings the diesels need to shut off when other renewable resources are available, but to do so the power electronics must be advanced enough to meet the needs of the grid. Further development of large hybrid inverters is needed to advance this technology. ACEP will analyze state of the art inverters to control the systems in a diesel-off mode. Being able to do so will save significantly on the capital cost of installed projects and increase the overall simplicity of hybrid power systems.

This project will include a review of potential power electronics systems for testing and construction of a test bed and hardware testing. The project will focus on the systems review and the utilization of a laboratory test bed for hardware testing. The project will be completed through the WiDAC which is managed and operated as a consortium of industry and private sector partners involved in the development of wind-diesel systems in Alaska.

Project Objectives:

1. Address technical issues related to higher penetration of wind as part of overall generation portfolio in order to reduce the amount of diesel fuel used and improve the economics of existing and planned wind-diesel systems.
2. Address issues specifically related to operation of turbines and ancillary equipment in remote locations.
3. Take high penetration systems to the next level by enhancing the rate of success of diesel-off operations.
4. Solidify Alaska as the leader in wind-diesel technology worldwide and expand employment and economic opportunities in the sector.

All Commission funding is intended for use for the scope of work identified in the Award document only. Any balance of funds remaining after the full scope of work has been completed will be returned to the Denali Commission.

2. Milestones

The following milestones are identified as the major steps to be completed as part of the project. "Planned" dates for the first milestone are included here. As part of each progress report, recipients shall update the progress toward meeting these milestones (see section 7, Reporting).

Milestone	Planned		Actual		Units	Total Cost At Completion
	Start Date	End Date	Start Date	End Date		
In-Progress	01/01/2010	03/31/2011			0	\$0.00
Project Close-out	04/01/2011	06/30/2011			0	\$0.00

3. Award Performance Period

The Award performance period is January 1, 2010 through March 31, 2011. This is the period during which Award recipients can incur obligations or costs against this Award.

4. Direct and Indirect Costs

The cost principles of OMB A-21 are applicable to this Award. Indirect costs up to 5% are allowable toward this project and funded through Award #1194. Please refer to the cost principles regulations for specific details on other allowable charges under this Award.

5. Budget and Program Revisions

The Administrative Circular, 2 CFR Part 215, applies to this Award. Please refer to the Administrative Circular for specific details on revisions to this Award. The Administrative Circular requires that ACEP will inform the Commission in writing (e-mail, letter, or report) at the earliest possible date of any unanticipated project cost overrun, project schedule delays, or changes in the project scope or changed site conditions.

6. Payments

Payments under this Award will be made by electronic transfer in response to a "Request for Advance or Reimbursement", Standard Form 270 (SF-270) submitted by ACEP. Requests for reimbursements may be made as needed. The SF-270 must be submitted to the Denali Commission via fax, e-mail (finance@denali.gov) or mail in order for payment to be processed. The form is available on the OMB website: http://www.whitehouse.gov/OMB/grants/grants_forms.html. Payments shall be made in accordance with 2 CFR Part 215. Please contact the Denali Commission's Finance Specialist at (907) 271-1414 for further information about submitting this form. **No interest will be accrued on these funds.**

7. Reporting

Two forms of project reporting are required under this Award, listed below. ACEP shall submit reports using the Denali Commission's on-line Project Database System, available at www.denali.gov. If there are technical limitations which may prevent the recipient from meeting this requirement, please contact the Program Manager listed in this agreement.

- a. **Progress Reports** shall be submitted on a quarterly basis. The first reporting period is January 1, 2010 to March 31, 2010, and quarterly thereafter. Reports are due within 30 days of the end of the reporting period. Progress reports shall include the following:

- i. Total project funding, including both Denali Commission funding and other project funding sources.
 - ii. The total project expenditures for the project as of the end of the reporting period, including both Denali Commission and Other funding sources.
 - iii. Updated schedule and milestone information as identified in the Scope of Work.
 - iv. Narrative summary of the project status and accomplishments to date, and address the following questions: is the project on schedule, is the project on budget, and what actions are planned to address any project problems.
 - v. For minor repair and renovation projects or other non-construction projects, pictures should be provided of before and after, or photos that are representative of the funded activity, to the extent possible. Photos shall be provided in a digital format as part of the on-line report. A short description of the activity and names of those in the photos shall also be provided.
- b. **Federal Single Audits** shall be submitted annually, when required. In accordance with OMB Circular A-133, which requires [subpart 200] “Non-Federal entities that expend \$500,000 or more in a year in Federal awards shall have a single or program-specific audit conducted for that year in accordance with the provisions of this part [subpart 205]. The determination of when an award is expended should be based on when the activity related to the award occurs.”

Recipients shall also submit single audits to the Federal Clearinghouse as designated by OMB. Information can be found on the following web-site:
<http://harvester.census.gov/sac/>

8. *Project/Award Close-Out*

The project close-out report shall be completed within 90 days of the end of the Award performance period or within 90 days of the completion of the project, whichever is earlier. Recipients must also draw down any remaining funds for expenditures incurred under this award during this 90-day period.

The project close-out report shall be submitted on-line through the Denali Commission's on-line Project Database System, available at www.denali.gov. The project close out will require the recipient to submit the following information:

- a. Final data for each item listed in paragraph 7(a) “Progress Reports”.
- b. Final project expenditures itemized by the following categories: planning & design; materials & equipment; freight; labor; project administration/overhead and other expenses.
- c. Acknowledgement of support: For all non-construction projects, the Award recipient shall include an acknowledgement of the Government's support for the project(s) developed under this Award. The allowable format shall be use of Denali

Commission logo on any printed materials referencing the emerging technologies program and mention in any public presentations. Costs associated with this requirement shall be paid out of the project funding received by the Award recipient from the Denali Commission.

9. Public Policy Laws and Assurances

Award Recipients are required to comply with the public policy laws and assurances on SF 424b. This form must also be signed by a certifying official of the organization. Some of the laws are highlighted below for your reference.

To the maximum extent practicable, considering applicable laws, Funding Recipients shall accomplish the project contemplated by the Award using local Alaska firms and labor.

No portion of this award may be used for lobbying or propaganda purposes as prohibited by 18 U.S.C. Section 1913 or Section 607(a) of Public Law 96-74.

Project level environmental reviews in accordance with the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) are required for each project undertaken with Denali Commission funds.

10. Non-Compliance with Award Conditions

Recipients not in compliance with the terms and conditions of this Financial Assistance Award will be notified by the Denali Commission. The Denali Commission will work with the recipient to identify the steps necessary to bring them back into compliance, and will establish an appropriate time frame for the corrections to be made. If the corrections have not been made by the deadline, the Denali Commission reserves the right to either suspend or unilaterally terminate the Financial Assistance Award for non-performance.

11. Program Manager, Financial Manager & Other Contact Information

Denali Commission	Alaska Center for Energy and Power
Denali Daniels Program Manager 510 L Street, Suite 410 Anchorage, AK 99501 Phone: 907-271-1189 Fax: 907-271-1415 E-mail: ddaniels@denali.gov	Gwen Holdmann Project Manager 451 Duckering Building Fairbanks, Alaska 99775-5880 Phone: 907-590-4577 Fax: 907-474-6686 Email: gwen.holdmann@uaf.edu
Betty Sorensen Grants Administrator 510 L Street, Suite 410 Anchorage, AK 99501	Maggie Griscavage Financial Contact 3295 College Road, 109 ASC Fairbanks, AK 99775-7880

Phone: 907-271-3415 Fax: 907-271-1415 E-mail: bsorensen@denali.gov	Phone: 907-474-6446 Fax: 907-474-5506 Email: gmgriscavage@alaska.edu
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12. Other Project Specific Paragraphs

In addition to reporting quarterly, ACEP shall meet twice annually with the Commission to report lessons learned and project status.